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Justitia desmaresti (Massalongo, 1854) (Crustacea, Decapoda) from the Lutetian (Middle Eocene) of Monte Bolca (Verona, N Italy)

Riassunto – *Justitia desmaresti* (Massalongo, 1854) (Crustacea, Decapoda) del Luteziano (Eocene medio) di Monte Bolca (Verona, N Italia).

La recente scoperta di crostacei decapodi palinuridi nei terreni eocenici dell'area vicentina ha reso indispensabile un confronto con gli esemplari di Monte Bolca, depositati presso Istituti di ricerca italiani e stranieri. Questo confronto ha messo in evidenza la necessità di un attento lavoro di revisione dei palinuridi del giacimento veronese, suffragato anche dal fatto che non è stata mai data alle stampe una loro attenta e approfondita descrizione morfologica. I palinuridi del giacimento veronese furono segnalati per la prima volta nel 1822 da Desmarest, il quale li attribuì al solo genere *Palinurus* Weber 1795, mentre la loro attribuzione specifica risale alla seconda metà dell'Ottocento, quando un esemplare, appartenente alla collezione privata del barone Achille De Zigno, fu attribuito dallo stesso De Zigno a *Palinurus desmaresti*, sulla base del precedente lavoro di Desmarest. Tale attribuzione non fu però avvalorata né da una descrizione morfologica né da una raffigurazione iconografica. Dopo questa segnalazione, resti fossili di palinuridi furono scoperti nel corso di scavi effettuati nella seconda metà dell'Ottocento. Anche se alcuni autori citano questi esemplari nei loro lavori e carteggi epistolari, si dovrà attendere il lavoro di Secretan del 1975 perché vengano esaminati, se pur sommariamente, da un punto di vista morfologico. Questo lavoro di revisione è stato effettuato esaminando il materiale originario dell'Ottocento, depositato presso il Museo di Storia Naturale di Verona, il Museo di Geologia e Paleontologia dell'Università di Padova e il Naturhistorisches Museum di Vienna, e il materiale rinvenuto nel secolo scorso, depositato presso il Museo dei fossili di Monte Bolca e il Museo di Storia Naturale di Milano. Grazie ad alcuni caratteri morfologici, quali l'ornamentazione a scaglie embricate del carapace e la presenza di 3 solchi trasversali e paralleli sui somiti addominali, si è potuto stabilire che gli esemplari esaminati sono da attribuirsi al genere vivente *Justitia* Holthuis, 1946 con *J. desmaresti* (Massalongo, 1854) (non De Zigno in quanto per le regole del Codice di Nomenclatura Zoologica, Massalongo è stato il primo autore a figurare un palinuride di Monte Bolca) e non a *Palinurus* Weber, 1795. Inoltre, un esemplare del campione esaminato è da attribuirsi a *Parribacus* Dana, 1852 con *P. cristatus* Forster, 1984 (infraordine Palinura, Latreille, 1803, famiglia Scyllaridae Latreille, 1825). La presenza di *Justitia* Holthuis, 1946 a Monte Bolca comprova ulteriormente la diffusione di questo genere nel Terziario inferiore veneto, suffragata dalla sua recente scoperta nei terreni lutaziani (Eocene medio) di Nogarole Vicentino (Chiampo - Vicenza, N Italia).

Parole chiave: Crostacei, Decapodi, Eocene medio, Italia.

Abstract – The recent discovery of palinurid decapod crustaceans in the Eocenic deposits of Vicenza province needed a comparison with Monte Bolca specimens, housed in Italian and foreign research Institutes and Museums. This comparison has pointed out the need of a careful review of

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Monte Bolca palinurids, since a deep morphological description has never published. The palinurids of Veronese outcrop were reported for the first time in 1822 by Desmarest who ascribed them to the only genus *Palinurus* Weber, 1795. The specific ascription of Monte Bolca palinurids dates back to the second half of the nineteenth century, when one specimen, belonging to Achille De Zigno's private collection, was ascribed by De Zigno himself to *Palinurus desmaresti*, thanks to the previous Desmarest's paper. However, this ascription was not confirmed neither with a morphological description nor with iconographic materials. After this report, other palinurids were discovered during excavations carried out in the second half of the nineteenth century. Even though some authors quoted in their papers and correspondence these specimens, it will be necessary to wait for Secretan's paper in 1975 because they are studied briefly from a morphological point of view. This review, carried out on original sample of the nineteenth century, housed in the Natural History Museum of Verona, the Geology and Palaeontology Museum of the University of Padua and the Naturhistorisches Museum of Wien, and on specimens discovered in the last century, housed in the Fossil Museum of Monte Bolca and the Natural History Museum of Milan, has allowed to establish - thanks to some morphological features, such as the ornamentation with imbricate scales of the carapace and the presence of 3 transversal and parallel grooves on abdominal somites - that the specimens are to be ascribed to the living genus *Justitia* Holthuis, 1946 with *J. desmaresti* (Massalongo, 1854) (not De Zigno according to the rules of the Code of Zoological Nomenclature, Massalongo was the first author to represent a palinurid of Monte Bolca) and not to *Palinurus* Weber, 1795. Moreover, one specimen of the studied sample is to be ascribed to *Parribacus* Dana, 1852 with *P. cristatus* Förster, 1984 (infraorder Palinura Latreille, 1803, family Scyllaridae Latreille, 1825). The presence of *Justitia* Holthuis, 1946 at Monte Bolca outcrop confirms the wide spread of this genus in the Lower Tertiary of Veneto, after its recent discovery in the Lutetian deposits (Middle Eocene) of Nogarole Vicentino (Chiampo - Vicenza, N Italy).

Key words: Crustacea, Decapoda, Middle Eocene, Italy

Previous studies of palinurid decapod crustaceans of Monte Bolca

Monte Bolca palinurids object of this review and housed in Italian and foreign Museums and Research Institutes, date back mainly to excavations carried out in the second half of the nineteenth century. The specimens were ascribed by some authors to *Palinurus desmaresti*, as it is possible to establish by the original labels enclosed to the specimens. Some bibliographic sources (more letters than true scientific papers) showed that neither holotype nor paratypes were described in about one and a half centuries and no author has ever printed a deep morphological analysis of this species. Therefore this review had difficulties in establishing *P. desmaresti* which author belongs to, due to the poor bibliographic sources and iconographic materials. In some cases the original collection of letters was lost, thus requiring a purely deductive analysis to establish the approximate publication dates of the papers.

Monte Bolca palinurids were mentioned for the first time in "Histoire Naturelle des Crustacés fossiles" by Desmarest (1822, p. 131), who ascribed them to *Palinurus* Weber, 1795, without giving neither a morphological description nor any iconographic materials. The author wrote: "*Un Crustacé de la collection du Muséum, compris dans les feuillets du calcaire marneux de Monte Bolca, appartient évidemment à ce genre, car ses antennes et ses pieds présentent clairement les caractères nous avons indiqués, et sa taille est à peu prés celle de la langouste commune (Palinurus quadricornis). Sa carapace n'étant pas bien conservée, nous nous abstiendrons de la décrire*". Unfortunately, the author didn't point out which specimen he studied as reference sample, whether the one housed at the Natural History Museum of Verona or that kept in the Geology and Palaeontology Museum of the University of Padua.

The ascription of Monte Bolca specimens to *P. desmaresti* must probably be referred to the baron Achille De Zigno who, inventorying a specimen of his own private collection (about 10.800 specimens, later bought by Giovanni Omboni and given to the University Cabinet of Padua in 1896), referenced to Desmarest's paper (*desmaresti* = of Desmarest), reporting what this author wrote in his paper about Monte Bolca palinurids. This hypothesis would be also confirmed by the original label enclosed to the specimen, presently housed at the Geology and Palaeontology Museum of the University of Padua (MGPD 6804Z – fig. 1): the handwriting and the signature are those of De Zigno, supported also by the French language usually used by the baron in his papers.

Lacking the original collection of letters we believe that the work carried out by De Zigno on the specimen of his own collection was limited only to filing, for two main reasons: on the basis of Omboni's commemorations (1892, 1897), De Zigno published, during his long activity of scientist, only two papers on invertebrates (De Zigno, 1870, 1881), where Monte Bolca palinurids are not considered; Massalongo (1855, p. 52) mentions *P. desmaresti* De Zigno *in litteris*, thus supporting the hypothesis that De Zigno limited himself to filing, without establishing holotype.

Catullo (1854) took interest in Monte Bolca palinurids before Massalongo. In fact, the Italian scientist, referring to the specimens housed at the University Cabinet of Padua, ascribed them to *Palinurus* Weber, 1795, without giving either a morphological description or a specific ascription. The author wrote in a letter addressed to Professor Naumann from Leipzig: "*Altre fatte esistono, non già nella calcaria grossolana propriamente detta, ma in quella di compage scissile, che si eleva in valle di Vestena nel tenere di Bolca, i quali si riferiscono alla famiglia Macrouri, o crostacei a coda lunga. (....) Stando a Latreille, gli animali fossili, di cui intendo parlarvi, entrerebbero nella tribù dei Langustini del citato Entomologo, o meglio nella famiglia degli Astacini, divisata da Milne-Edwards nell'ultima edizione per lui esibita dell'Opera di Lamark. Il corpo, ch'è grande, oblungo, subcilindrico, non isporge dal piano della roccia che lo accoglie; stantechè, spezzando la calcaria schistosa nel senso della direzione delle sue fessure, si vede sopra ciascuna delle due metà l'imagine del crostaceo, come appunto si ammira nelle Filliti e negli Ittioliti della medesima località. (...) I quattro Astacini, che ho sotto gli occhi, si veggono inclusi dentro otto pezzi di calcaria ittiolitica, due dei quali hanno la lunghezza di sedici centimetri, comprese le antenne primarie, giacchè il corpo non ne presenta che dieci soltanto; e doppiamente maggiore riuscirebbe se la coda, che vuolsi più lunga del corpo, non si fosse ripiegata inferiormente in sé stessa, occultando così le natatoje disposte a ventaglio, che porta sull'apice. Rimangono alcune vestigia delle due antenne intermediarie; e delle zampe non si veggono che le cinque del lato diritto, le quali, ove sono complete, finiscono in un'unghia acuta. Questi caratteri hanno non poca conformità con quelli del genere Palinurus di Olivier, a cui credo senza esitanza di poter conguagliare le spoglie sopradette; ma in vista dello stato malconcio di esse non sarà facile nemmeno ad osservatori accorti e diligenti di rilevarne agginstamente i caratteri della specie. Le due spoglie maggiori, che sono anche meno guaste delle altre, hanno molto attinenza col Palinurus communis, specie che sussiste tuttavia nel Mediterraneo e nell'Oceano europeo; ma per le ragioni allegate non*

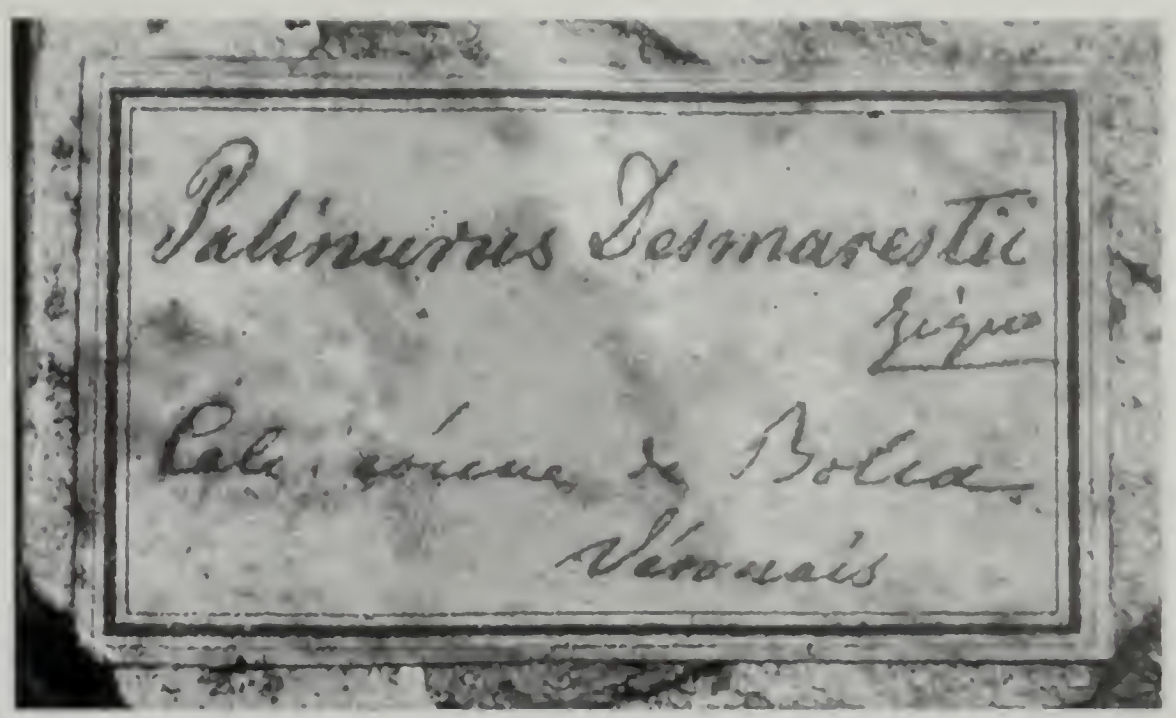

Fig. 1 – Specimen MGPD of De Zigno private collection (left) and its original label written by De Zigno himself (above).

arrischierei affermare che a questa piuttosto che ad altre appartenessero, benché si sappia ch'essa fu trovata altre volte nella calcaria marnosa di Bolca (Desmarest, Crust. Fossil., pag. 131). Quand'anche vi fosse qualcuno fra di noi, il quale volesse a tutto costo contradistinguere questo fossile con nuovo nome, come spesso succede, si troverebbe da poi nell'ingrata certezza di non avere rettamente imbeciato nel segno. Con queste mie parole ho voluto solamente far osservare che al genere Palinurus spettano le reliquie ostensibili nel Gabinetto di Padova.".

Massalongo (1855) mentioned *P. desmaresti* De Zigno *in litteris*, pointing out that in his following paper "*Compendium faunae et florae fossilis Bolcensis*", would have given a deeper description of this species. Unfortunately, his untimely death when he was only 36 years old didn't allow the printing of this paper, but only of the tables already published in 1854. Table XII reports a big-sized specimen, preserved in part and counterpart and housed in the Collection of the Natural History Museum of Verona (MSNV 91-91bis, Fig. 2). On the basis of the rules of the Code of Zoological Nomenclature (International Commission on Zoological Nomenclature, 1999: article 12 – names published before 1931 – 12.1, 12.2.7), it should be the first true description of *P. desmaresti*, even though it is not supported with a text of commentary. Therefore, this specimen represents the holotype of the species that should be ascribed to Massalongo and not to De Zigno.

Fabiani (1915, p. 286) wrote about the arthropod faunistic assemblage of the Middle Eocene of Veronese province: "*Dei Macruri infatti abbiamo scarsi avanzi e anche questi di solito determinabili poco più che genericamente (due specie indeterminate di Palaemon sono citate dal Ristori nel Rupeliano di Chiavon). Soltanto a Bolca, a giudicare dagli esemplari conservati nelle vecchie collezioni (es. nel Museo dell'Istituto Geologico dell'Università di*

Padova e nel Museo di Verona), erano discretamente rappresentati anche i Macruri, sopra tutto da una grossa forma che il De Zigno aveva chiamato Palinurus desmaresti". Since Massalongo was the first author who mentioned this species named by De Zigno, we might suppose that probably Fabiani simply copied out in his paper what Massalongo (1855) reported.

Fig. 2 – Specimen MSNV 91 illustrated by Massalongo in the Tab. XII of his incomplete opera "*Compendium faunae et florae fossilis bolcensis*" (left). This is the holotype of *Justitia desmaresti* (Massalongo, 1854).

Monte Bolca palinurids were studied again sixty years later by Secretan (1975), who reported only a brief morphological description, ascribing the studied sample (specimens housed at the Natural History Museum of Verona, the Geology and Palaeontology Museum of the University of Padua and the Naturhistorisches Museum of Wien) only to the species *P. desmaresti*, but pointing out the possible existence of two distinct forms. In fact, the author wrote: "*Il est évidemment possible qu'il y ait deux espéces de Palinurus à Monte Bolca. L'une posséderait un premier péréiopode massif et une ornementation granuleuse, l'autre aurait des péréiopodes grêles, et un test d'aspect écailleux*". Our review has allowed to point out that the French author incorrectly ascribed the species of Monte Bolca to De Zigno, also making a mistake on the publication date (1915), which probably referred to Fabiani's paper.

Modes of preservation and materials

Monte Bolca palinurids, studied in this review, come from excavations carried out in the second half of the nineteenth century and during the twentieth century. Therefore, their state of preservation is generally rather deteriorated because of the poor attention paid to their protection over the years. In fact, the layer surfaces and the specimens are generally patinated and worn out, thus making very difficult the identification of the main morphological features in many specimens.

As mentioned above, Secretan (1975, p. 340) pointed out the probable presence of two palinurid forms for the different carapace ornamentation. We suppose that this hypothesis was suggested by the different preservation modalities of the carapace (partial preservation or total destruction) and of its ornamentation (imbricate scales or tubercles). In reality, despite the different modalities of preservation of the specimens, it was possible to observe in the sample common morphological features and similar ornamentation of the carapace, enough to exclude the possible presence of two different forms.

The studied sample consists of 25 specimens, housed at the Natural History Museum of Verona (18 specimens), the Geology and Palaeontology Museum of the University of Padua (3 specimens), the Natural History Museum of Milan (1 specimen), the Fossil Museum of Monte Bolca (2 specimen) and the Naturhistorisches Museum of Wien (1 specimen).

This review has allowed to establish that 22 specimens are to be ascribed to the living genus *Justitia* Holthuis, 1946 with *J. desmaresti* (Massalongo, 1854) (infraorder Palinura Latreille, 1803, family Palinuridae Latreille, 1802), while 2 specimens (MSNV 05, 21-21bis) are not determinable. One further specimen (MSNV 68) ascribed by Secretan (1975) to *P. desmaresti* (Massalongo, 1854) is instead to be ascribed to *Parribacus cristatus* Förster, 1984 (infraorder Palinura Latreille, 1803, family Scyllaridae Latreille, 1825).

Acronyms: MSNV, Natural History Museum of Verona; MGPD, Geology and Palaeontology Museum of the University of Padua; MSNM, Natural History Museum of Milan; MFB, Fossil Museum of Monte Bolca; NHMWien, Naturhistorisches Museum of Wien.

Systematics

Infraorder Palinura Latreille, 1803
Family Palinuridae Latreille, 1802

Genus *Justitia* Holthuis, 1946
Type-species, *Palinurus longimanus* H. Milne-Edwards, 1837

Justitia desmaresti (Massalongo, 1854)
Figs. 3, 4, 5, 6, 7

1822 – *Palinurus* Weber, 1795; Desmarest, p. 131.
1840-1850? – *Palinurus desmaresti*; De Zigno.
1854 – *Palinurus* Weber, 1795; Catullo.
1854 – *Palinurus desmaresti* De Zigno; Massalongo, Tab. XII.
1855 – *Palinurus desmaresti* De Zigno; Massalongo, p. 52.
1915 – *Palinurus desmaresti* De Zigno; Fabiani, p. 286.
1975 – *Palinurus desmaresti* De Zigno, 1915; Secretan, p. 339.

Diagnosis: Subcylindric and elongate carapace; two strong supraorbital teeth; dorsal region of carapace divided by a deep median cervical groove; dorsal region of carapace adorned with small-sized imbricate scales; 3 transverse grooves on the abdominal somites II-V.

Holotype: MSNV 91-91bis.

Type locality: Monte Bolca (Verona, N Italy).

Geological age: Ypresian-Lutetian (Middle Eocene).

Materials: 22 specimens in a good state of preservation, 8 of which are preserved as part and counterpart.

MSNV: 17-17bis, CR17, 18, M02, 19, 20, 23B, 23-90bis, 24, 25-25bis, 91-91bis, 92, 93, 94, 95.

MGPD: 6804Z, 7447C-7450C, 7448C-7449C.

MSNM: i22867.

MFB: I.G. 91130, I.G. 132590-132605.

NHMWien: 1853/XXVII/59-1853/XXVII/60.

Since Secretan (1975) gave just a brief account of the morphology of this species, we believe useful to give a more detailed description of this species, on the basis of a deeper analysis of the sample.

Description. Big-sized palinurid, with strong exoskeleton and with 6 to 22 cm of total length.

Carapace. The carapace, in dorsal view in most specimens, is elongate, subcylindric and compressed along the margins. Two strong supraorbital teeth rise above the ocular incisions. A small-sized rostrum is present between these teeth. The ocular incisions are narrow and shallow. The dorsal surface of the carapace is divided in the median part by a deep cervical groove, making the antennal and gastric regions on one side and the branchial and cardiac regions on the other side. Moreover, the dorsal surface of the carapace presents an ornamentation made of imbricate scales, on which strong, small-sized tubercles set up.

Abdomen. The subrectangular abdominal somites have the same length. Somites I-V are crossed by three transversal and parallel grooves. The tail fan is

preserved just in one specimen (MSNV 24). Endopodite and exopodite have a strong protopodite and are crossed by a thick sequence of parallel lines. The subrectangular telson doesn't present a particular ornamentation.

Cephalic appendages. The eyes are preserved only in one specimen (MSNV 23): they are subovoidal in shape and supported by a short eye-stalk. The antennulae are made by three articula (I and III thin and elongate, II thin and short) and by two short flagella. The antennae are made by three strong articula: II is provided of a strong spine along the outside margin, by the articulation with the third; III presents a strong spine on the outside margin and two spines on the

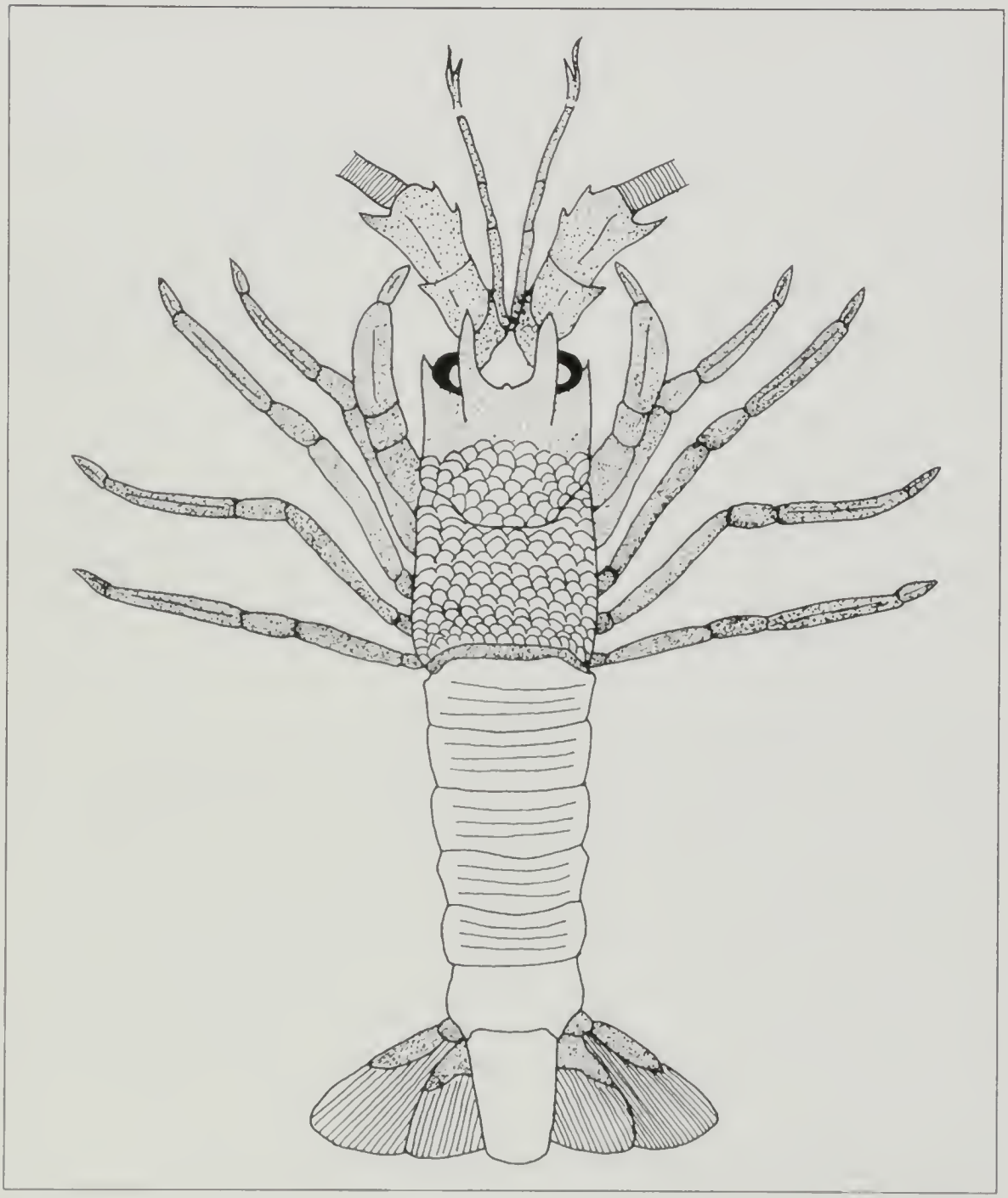

Fig. 3 – *Justitia desmaresti* (Massalongo, 1854), reconstruction.

inside margin. The two articula are crossed by a thin carina along the quasi-median line. The antennal flagellum, covered by a thick sequence of small-sized tubercles, has the same length of the body. As pointed out by Secretan (1975), two prominences, probably the strongly calcified mandible, are present by the cervical groove.

Thoracic appendages. They are well preserved in most specimens. Pereiopod I, shorter than the others, is characterized by a particularly strong and short propodus. Pereiopods II-V, having the same length, are made by thin and elongate articula. Dactylus and propodus of all pereiopods are crossed by a thin median carina.

Abdominal appendages. The pleopods are not visible in any specimen.

Observations

The particular ornamentation of the carapace with small-sized imbricate scales, the presence of two strong supraorbital teeth and abdominal somites crossed by transversal and parallel grooves, have allowed the comparison of the studied specimens with the following four fossil genera, *Jasus* Parker, 1883, *Archaeocarabus* M'Coy, 1849, *Paleopalinurus* Bachmayer, 1954 and *Palinurus* Weber, 1795, that show affinities in carapace ornamentation or in some other morphological features.

Jasus Parker, 1883 was known to date in the fossil record only with *J. fleming*i Glaessner, 1969 of the Oligocene of New Zealand. Recently, Garassino (2001) has reported the presence of this genus in the Cenomanian (Upper Cretaceous) of Lebanon. Holthuis (1991, p. 91-94) pointed out its main features: long rostrum, marked by a pair of well developed supraorbital teeth, carapace with two strong median teeth in the antennal region and carapace ornamentation made with different sized spines, uniformly arranged on the surface. Monte Bolca specimens share with this genus the pair of supraorbital teeth. However, the different ornamentation of carapace and abdominal somites of our specimens rules out the ascription to this genus.

Archaeocarabus M'Coy, 1849 is known to date only with *A. bowerbanki* M'Coy, 1849, of the Lower Eocene of England. Moreover, this genus is reported in dubitative form in the Cretaceous and Tertiary of United States and Fiji Islands (Rathbun, 1935, 1945; Roberts, 1962). Quayle (1987) pointed out the main features of this genus: medium-sized rostrum, bearing three spines, supraorbital teeth widely separate and carapace ornamentation made of tubercles, uniformly arranged on the surface. The different arrangement of the supraorbital spines and carapace ornamentation made of imbricate scales rule out the ascription of *J. desmaresti* (Massalongo, 1854) to this genus.

Palaeopalinurus Bachmayer, 1954 is known in the Tithonian (Upper Jurassic) of Germany with *P. glaessneri* Bachmayer, 1954. Bachmayer (1954) described this genus, pointing out its main features: cylindric carapace without rostrum, well developed cervical groove, well developed supraorbital teeth and branchial and cardiac regions characterized by an ornamentation with deep parallel grooves. The incomplete specimens (11 in all) belonging to this species made a comparison with Monte Bolca specimens quite difficult. However, the imbricate scales ornamentation of the carapace and the presence of three

transversal and parallel grooves on the abdominal somites of *J. desmaresti* (Massalongo, 1854) rule out its ascription to this genus.

Palinurus Weber, 1795 is known from the Lower Cretaceous: in the Albian of Campania (Southern Italy) with *P.* sp., in the Turonian of Boemia with *P. woodwardi* Fritsch & Kafka, 1887, in the Cenomanian of Hakel (Lebanon) with *P.* sp. and in the Senonian of Germany with *P. baumbergicus* Schlüter, 1872 (Schlüter, 1872; Fritsch & Kafka, 1887; Garassino, 1994; Bravi & Garassino, 1998). Zariquiey Alvarez (1968, p. 212) and Holthuis (1991, p. 91-94) pointed out the main features of *Palinurus* Weber, 1795: short or absent rostrum, subcylindric carapace, strong and well developed supraorbital teeth, deep cervical groove, carapace ornamentation made of spines or tubercles, uniformly arranged and smooth abdominal somites crossed by two transversal grooves. The different ornamentation of the carapace and abdominal somites rules out the ascription of *J. desmaresti* (Massalongo, 1854) to *Palinurus* Weber, 1795.

The comparison is not restricted to the fossil genera only, but it has been enlarged also to the eight living genera of the family Palinuridae Latreille, 1802, some of which already known in the fossil record: *Jasus* Parker, 1883, *Justitia* Holthuis, 1946, *Linnparus* White, 1847, *Palinurus* Weber, 1795, *Palinustus* A. Milne-Edwards, 1880, *Panulirus* White, 1847, *Projasus* George & Grindley, 1964 and *Puerulus* Ortmann, 1897.

Justitia Holthuis, 1946 is the genus showing the best morphological affinities with the studied specimens among the above-mentioned genera. Holthuis (1991) pointed out the main features of this genus: short rostrum with two or three supraorbital spines, carapace with ornamentation made of imbricate scales, deep cervical groove, three strong spines running from the ocular incisions to the cervical groove and dorsal surface of the abdominal somites crossed by transversal and parallel grooves.

Many of the above-mentioned features are also present in Monte Bolca specimens, which are therefore ascribed to this genus.

Justitia Holthuis, 1946 is reported for the first time in the fossil record in the Middle Lutetian (Eocene) of the quarry "Albanello" in Nogarole Vicentino (Chiampo - Vicenza, Northern Italy) with *J. vicetina* n.sp. (Beschin *et alii*, in press). *J. desmaresti* (Massalongo, 1854) is different from *J. vicetina* for the presence of imbricate scales on the whole carapace surface and for the presence of just three transversal and parallel grooves on the abdominal somites (Fig. 4). The age of the two outcrops is also different. In fact, the study of calcareous nannoplancton by Medizza (1975), carried out on "Pesciaia" of Bolca, allows to ascribe a Late Ypresian-Lower Lutetian age to this outcrop, while the quarry "Albanello" is Middle Lutetian in age.

Justitia Holthuis, 1946 is known with five living species: *J. longimanus* (H. Milne-Edwards, 1837), *J. japonica* (Kubo, 1955), *J. mauritiana* (Miers, 1882), *J. chani* Poupin, 1994 and *J. vericeli* Poupin, 1994. They live in the warm waters of Indo-Pacific and Western Atlantic, having a preference for rocky or coralligeneous-sandy bottoms, usually at a depth included between 50 and 300 m. The most cosmopolitan of these species is *J. longimanus* (H. Milne-Edwards, 1837) with the following geographical distribution: Western Atlantic region (Bermuda, S. Florida, Caribbean arc from Cuba to Margarita Island, Curaçao, E. Brazil), Madagascar, Reunion, Mauritius, Taiwan, Japan, Hawaii and French Polinesia (Poupin, 1994).

Fig. 4 – Comparison between *J. desmaresti* (Massalongo, 1854) (A) and *J. vicetina* n.sp. (B).

J. desmaresti (Massalongo, 1854) shows some morphological affinities with *J. mauritiana* (Miers, 1882) of Indo West Pacific region (Western Indian Ocean and Hawaiian Arcipelago), above all for the disposition of imbricate scales of the carapace, the antennal articula with strong spines on outside margins and the course of the three transversal grooves on the abdominal somites. It is instead different the structure of pereiopod I: in fact in *J. desmaresti* (Massalongo, 1854) pereiopod I has a terminal dactylus, while in *J. mauritiana* (Miers, 1882) pereiopod I is subchelate.

After the recent discovery of *Justitia vicetina* n.sp. in the quarry "Albanello" of Nogarole Vicentino (Beschin *et alii*, in press), the ascription of Monte Bolca specimens to the same genus confirms further the wide spread of *Justitia* Holthuis, 1946 in the Lower Tertiary of Veneto.

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Fig. 5 – *Justitia desmaresti* (Massalongo, 1854), n.cat. MSNV 23, photo and reconstruction (x0.3).

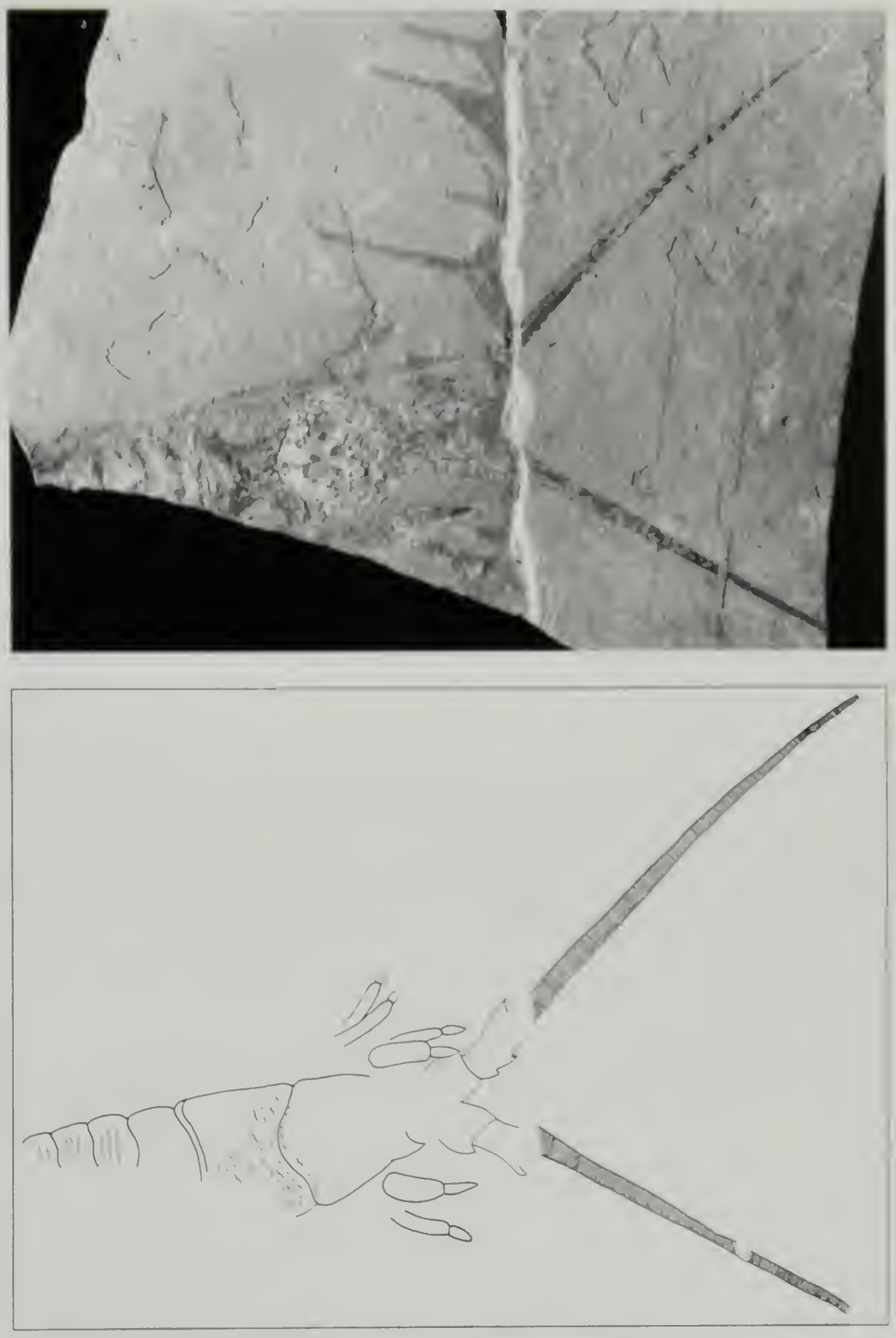

Fig. 6 – *Justitia desmaresti* (Massalongo, 1854)., n.cat MSNV 23B, photo and reconstruction (x0.3)

Fig. 7 – *Justitia desmaresti* (Massalongo, 1854), n.cat. MSNV 17bis, photo and reconstruction (x0.7).